QH
95.3
.W516
MOLL

West American Scientist

V. 6 (whole no. 45)

July 1889

MAY 30 1989
LIBRARIES

VOLUME VI. JULY, 1889. WHOLE NO. 45.

# THE West American Scientist.

*A popular monthly review and record for the Pacific Coast.*
*Official Organ of the San Diego Society of Natural History.*

C. R. ORCUTT, - - EDITOR.

## CONTENTS:


| | PAGE |
|---|---|
| Contributions from the San Diego Biological Laboratory—II.... *Carl Eigenmann* | 61 |
| Contributions to West American Botany—I | 62 |
| Trees and Shrubs of San Diego County, California.... *C. R. Orcutt* | 64 |
| Epoch of the Mastodon in North America..... *G. D. Story* | 66 |
| Opuntia Fruit as an Article of Food..... *Edward Palmer* | 67 |
| Some Notes on Tertiary Fossils of California ..... *C. R. Orcutt* | 70 |
| The Republic of Salvador..... *M. Lopatecki* | 71 |
| Native Plants of Australia | 75 |
| Briefer Articles—Preserving the Colors of Flowers; A Petrified Bird's Nest; Albinism Among Flowers | 76 |
| Proceedings of Scientific Societies | 77 |
| Bibliography | 79 |
| Editorial | 80 |
| Notes and News | 80 |


SAMUEL CARSON & CO.,
PUBLISHERS.
No. 208 POST STREET, - SAN FRANCISCO, CALIF.
*No. 1134 Fifth Street, San Diego, Calif.*

PRICE 10 CENTS. PER YEAR, $1.00.

[Entered at the Post Office at San Francisco as second-class matter.

# ANGLO-NEVADA
# ASSURANCE ✦ CORPORATION,

OF SAN FRANCISCO, CAL.

## FIRE AND MARINE.

Capital Fully Paid, $2,000,000.

OFFICE, 410 PINE STREET.

LOUIS SLOSS, - - - - - - - - - - - - President.
C. P. FARNFIELD, - - - - - - - - - - Vice-President.
Z. P. CLARK, - - - - - - - - - - - - Secretary.

**BANKERS: The Nevada Bank of San Francisco.**

# THE EVENING BULLETIN

SAN FRANCISCO, CAL.

ESTABLISHED 1855.

Is the leading evening journal in circulation and influence west of the Rocky Mountains. It is the recognized authority in mercantile and financial circles. Its high character, tone, and general worth commends it to, and has obtained for it, an entrance into the refined and cultured home circles, and made it the most popular family newspaper in California. The only journal publishing the Supreme Court decisions in full.

# THE WEEKLY BULLETIN

Is the largest and best weekly newspaper published in the west, and is in every respect a first-class family paper, appealing to the interest of every member of the household.

The Semi-Weekly Bulletin is the regular Weekly Bulletin and Friday's issue of each week.

TERMS OF SUBSCRIPTION

THE DAILY BULLETIN is served by carriers in San Francisco and the large towns of the interior at 25 cents per week.

*Daily, by mail or express,* - - - *per year,* $6.00
*Weekly, alone,* - - - - - - - " 1.50
*Weekly, with Daily of Friday,* - - - " 2.00

*Parts of a year in proportion*

Advertising Rates made known on application.

SAN FRANCISCO BULLETIN CO.

622 MONTGOMERY STREET, SAN FRANCISCO, CAL.

# Horsford's
# ACID PHOSPHATE

Prepared according to the directions of PROF. E. N. HORSFORD,

ESPECIALLY RECOMMENDED FOR

## Dyspepsia, Nervousness, Exhaustion, Headache, Tired Brain,

And all Diseases arising from Indigestion and Nervous Exhaustion.

—o—

This is not a compound "patent medicine," but a preparation of the phosphates and phosphoric acid in the form required by the system.

It aids digestion without injury, and is a beneficial food and tonic for the brain and nerves

It makes a delicious drink with water and sugar only, and agrees with such stimulants as are necessary to take.

DR. E. W HILL, Glens Falls, N. Y., says: "An excellent remedy for a tonic Dyspepsia, nervous and general debility, or any low state of the system."

DR. D. A. STEWART, Winona, Minn., says: "Entire satisfaction in cases of perverted digestion, loss of nerve-power, mal-nutrition and kindred ailments."

DR. G. H. LEACH, Cairo, Ill., says: "Of great power in dyspepsia and nervous prostration."

☞Descriptive Pamphlet Free.

**Rumford Chemical Works, Providence, R. I.**

## Beware of Substitutes and Imitations

☞Be sure the word "HORSFORD'S" is printed on the label.—All others are spurious.—Never sold in bulk.

PUBLICATIONS OF

# SAMUEL CARSON & CO.

No. 208 Post Street, San Francisco.

The San Francisco Book-House.

Publishers, Booksellers, and Stationers.

## A History of the College of California.

BY S. H. WILLEY, D. D.

It is now more than twenty years since the College of California was merged into **The California University.** The History of the old College is largely contemporaneous with the Early History of the State. The work is published by subscription.

1 vol., 8vo, 400 pages, cloth, paper label, - $4.00
1 " " " " bound in sheep, - 5,00

## California Tourists' Guide.

Revised and brought down to date; containing just such information as every Tourist wants.

The Guide will contain two maps of the city—one a bird's-eye view of San Francisco and surroundings, the other a street map. Table of distances, rates of fare, hotels and routes of travel, etc.

170 pages, 16mo, cloth limp, $1.00; illuminated paper covers, 50 cents.

## California Pictures in Prose and Verse.

BY BENJAMIN PARKE AVERY.

Quarto, cloth, 344 pages, beautifully illustrated with Engravings after drawings from Nature. $3.00.

## California, Three Hundred and Fifty Years Ago.

MANUELO'S NARRATIVE.

Translated from the Portuguese by a California Pioneer.

1 vol., 12mo. cloth, $1.50.

The above book purports to be a translation of a recently discovered Portuguese MS. giving a Sailor's Narrative of a Sojourn in California and Life Among the Indians 300 years ago.

## The Island Worlds of the Pacific Ocean.

BY CHARLES MARION TYLER.

With Maps and Illustrations.

1 vol., 8vo, 337 pages, cloth, - - $2.00

Some pains have been taken to make this work standard and reliable, especially with reference to the History, Discovery, Ethnology, Chronology, Geography, Area, Population, and Products of various Islands of the Pacific Ocean. The work is profusely illustrated both with wood-cuts and lithographs.

---

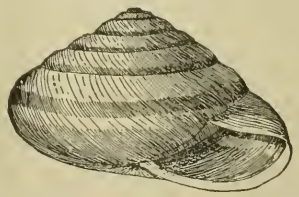
**A Book for the Sea-side, the Lake, and the Forest.**

## West Coast Shells.

A familiar description of the Marine, Fresh Water, and Land Mollusks found in the United States, west of the Rocky Mountains.

BY JOSIAH KEEP, A. M.

(Professor of Natural Science, Mills College).



At the sea-side, many pick up and admire a few shells without knowing anything of their name or nature. By the aid of this book such aimless shell-gathering may happily be changed into a source of intelligent and elevating pleasure.

The Frontispiece is a hand-painted engraving of the very rare and beautiful *Surcula Carpentariana*.

The book contains upwards of 230 pages, and 200 Engravings, and is carefully printed on fine, heavy paper, and neatly bound in cloth.

**Price, Postage Paid, $1.75, net.**

THE WEST AMERICAN SCIENTIST.

VOL. VI. JULY, 1889. No. 45

## *CONTRIBUTION FROM THE SAN DIEGO BIOLOGICAL LABORATORY—II.*

### *ON THE GENESIS OF THE COLOR-CELLS OF FISHES.*

So far as I am aware the origin of the color-cells or chromatophores of fishes has never been discussed. A. Agassiz (on the Young Stages of Bony Fishes, ii) has described the color changes of young flounders, and Agassiz and Whitman have promised a discussion of the genesis of the chromatophores in the second part of their paper on "The Pelagic Stages of Osseous Fishes" which has not yet appeared.

My observations have been based on the embryos of many species, but for the present purpose only those of Sciaena saturna, Hypsopsetta guttulata and Pleuronichthys coenosus (?) are available. Naturally the genus Stolephorus and many other Isospondylous fishes in which no color is observed forty-eight hours after hatching, are not available for a study of the origin of the color-cells; nor can any use be made of such genera as Oligocottus, Isesthes, Atherinops and Atherinopsis, in which the color appears in the egg after several days, and then appears at sometimes widely separate portions of the embryo.

The eggs of Hypsopsetta and Sciaena may always be collected in greater or less abundance in San Diego Bay during the latter part of April, the whole of May, and at least a part of June. The eggs are deposited at about five o'clock in the evening. They are pelagic; the only difference between the eggs of the two species seems to lie in the slight difference in size and in the number of oil-globules, Hypsopsetta invariably having one, Sciaena from two to eight.

The eggs were carried a mile before they could be studied, so that, in the earliest stage observed the blastodisk was segmented into four cells. The embryonic ring and shield appear in about twelve hours; the blastopore closes in about eighteen hours; the embryos are freed from the membrane in less than thirty-six hours. At the closing of the blastopore, the embryo and a part of the yolk are covered with scattered chromatophores. At this time the individual chromatophore is a large cell with a distinct nucleus and a few color granules; there may be present one or

two pseudopods; the dendritic form is not developed for some time. The color granules of most of the cells are brownish-yellow; those of comparatively few cells being black. The cells are so large that they may readily be distinguished before any color is deposited in them. The term chromatoblast may properly be restricted to them at this colorless stage. There are no chromatoblasts distinguishable when the embryonic shield begins to form; they first appear when the gastrula covers one-third or one-half the yolk. *They are proliferated into the segmentation cavity from the embryo, where the latter joins the embryonic ring and from here they migrate to various portions of the embryo.* Just how they arise I cannot say, as means for sectioning are not at hand. Further observations of living eggs may clear this point. As the gastrula advances over the yolk they increase in number very rapidly, but, as far as I have observed, by the process of proliferation only.

They are somewhat angular in shape, the angles being sometimes prolonged into pseudopods. Their depth at this time is equal to that of the segmentation cavity. In their migration the pseudopods are usually foremost; amoeboid changes in shape were not observed, the whole cell moving forward. Most of the chromatoblasts are collected along the margin of the embryonic shield. When the embryonic shield narrows and the embryo becomes more definitely outlined the chromotophores rapidly migrate inward and cover the embryo, while others collect about the oil-globules and but few remain over the yolk. Shortly after the closing of the blastopore in Scieana the oil-globules unite and the eggs of this species can then be distinguished from those of Hypsopsetta only by the very slight difference in size.

The chromatoblasts cannot be confounded with any other elements. They are approached in structure and position by the cells of the epiblast when about to divide. Such cells rise out from among the surrounding cells and project into the segmentation cavity, divide, and again sink to the ordinary level.

As chromatoblasts cannot be observed continuously from their origin to the chromatophore stage, should this process extend over several days or weeks, it is not possible to say positively whether the color-cells of the genera Oligocottus, Isesthes, etc., have a similar origin. The fact that their genesis in so widely different genera as Hypsopsetta and Sciaena is identical, would indicate that the color-cells in all fishes are developed in a similar manner. *Carl H. Eigenmann.*

* Preliminary Notice.

## *CONTRIBUTIONS TO WEST AMERICAN BOTANY.*

In this series of papers it is proposed to present in a connected form, such botanical observations as may be made by the writer, that may seem to contribute to a fuller knowledge of our West American flora. It is hoped that these may become worthy of the

above title as herbarium material and available literature increases. While much still remains to be done by the systematic botanist, it is believed that our flora offers a wider field for observations in other directions and of greater value to botanical science.

HOSACKIA (SYRMATIUM) HAYDONI.—Suffrutescent, six inches to a foot or more high, the slender stems woody at base, at first slightly spreading, then recurving inward and slightly intertwining, forming a loosely-compact bush, glabrous or nearly so throughout: leaflets three or less, oblong, obtuse, one to two mm. long: flowers single or more rarely in pairs, short pedunculate, two mm. long: calyx of equal length, the teeth narrowly subulate, erect, a half to one-fourth as long as the tube: pod but slightly incurved, usually twice the length of the persistent calyx, one seeded: seed dark olive-green, two and a half mm. long, slightly curved.

I take pleasure in dedicating this delicate species to Mr. Marion D. Haydon, in return for his hospitality and for his directing my attention to various forage plants whose valuable qualities had previously been unsuspected. Collected in April, 1889, growing among the rocks in a canyon leading into the Colorado desert, on the old stage line from San Diego to Ft. Yuma. With H. glabra, Torr., this plant is commonly known as the deer weed, but its smaller growth will render it less valuable for cultivation and it is apparently too limited in its distribution to assume importance as a wild forage plant.

STAMINODIA AND STAMENS.—In examining a large number of the flowers of Hookera minor, Britten, in the field this spring, I was somewhat surprised to find numerous specimens in which the staminodia were changed to perfect, fertile stamens. The first instance noticed was in a flower evidently injured by some insect, but so many examples were found later, where the staminodia were partially or wholly changed into anther-bearing stamens that I cannot ascribe it to the work of insects. This illustrates how little value can be placed in this genus on the unreliable characters of the stamens and staminodia.

HOOKERA ORCUTTII.—Greene, Bull., 6, Cal. Acad. Sci. 138. This species has been well characterized by Prof. Greene and is a very distinct species. Having examined a large number of the flowers in the field this season, I can speak positively of the absence of any traces of staminodia in any that I collected, and only three stamens were ever present. I first collected this species in 1882 in a valley about thirty miles north of San Diego, and later in the unusually wet seasons of 1884 and the present year. I found it abundant on our mesas, often associated with H. minor, Brit. The bulb is large, with a thick, fibrous envelope.

## *TREES AND SHRUBS OF SAN DIEGO COUNTY, CALIFORNIA.*

In the first bi-ennial report of the California State Board of Forestry, (1885-86), I contributed at the request of Hon. Abbot Kinney, a short paper under the above title. In it I briefly noted the general distribution in the county, of the ligneous plants that were known to me; thus it was necessarily incomplete, and some species were omitted as being scarcely worthy of mention. The article was further marred by a multitude of typographical errors and even whole pharagraphs by other authors were wrongly inserted under my signature.

Botanical science would not have been seriously affected, however, had the history of this unfortunate paper ended with the report of the California Board. But Hon. B. E. Fernow, chief of the Forestry division of the U. S. Department of Agriculture, saw fit to criticise my gratituous work as incomplete, in his second bulletin,(page 198), and, without consulting the writer or others who have had opportunity for an acquaintance with the subject, presented 'a complete list' of the trees and shrubs of San Diego county (pp. 202-5). This 'complete list' was compiled mainly from Watson's Botany of California, by Mr. Geo. B. Sudworth, and fully seventy species belonging to our flora was ommitted, and nearly a score of species were erroneously admmitted by him. Thus its scientific value was wholly destroyed, and curiously enough the compiler of this 'complete list' omitted nearly all the species enumerated in my paper, that were not mentioned in Watson's Botany.

The very evident worthlessness of this 'complete list' was enough to render criticism almost needless. But now a second edition of Bulletin No. 2, of the Forestry division comes to hand containing a list purporting to be a 'modification of that in the first edition.' In an editorial note the Chief says:

"The modifications have been made upon the authority of Mr. 'C. R. Orcutt and Dr. S. B. Parish, both of San Diego county, 'California. Thanks are especially due to Dr. Parish, who is 'writing a flora of this region, for the addition of several unpub-'lished species. The cacti, and other plants not truly shrubs or 'trees, have been omitted. A few species, however, not always 'woody throughout, have been inserted. The fact that Mr. Kin-'ney submitted a list confined to San Diego county must explain 'the insertion of such a limited list, while it would have been de-'sirable to embrace the flora of Los Angeles and San Bernardino 'counties as forming a true botanical region."

This explanatory note of the Hon. B. E. Fernow is almost as unfortunate as the rest of the history of this article. A letter to the Chief criticising the 'complete list' (by which the first edition may most conveniently be designated) with his apologetic reply, forms the whole of the correspondence between us, and the mod-

ified list has nearly the same omissions as the 'complete list,' notably, the Rhus ovata, Cixpressus Guadaloupensis, Berberis Fremontii, and other well known trees and shrubs of our county, and even the palm was ommitted from the 'complete list.' Mr. S. B. Parish, of San Bernardino, (*not* San Diego), who has an extensive acquaintance with the flora of Southern California, requested information relative to certain species that were included in the 'complete list' and after furnishing him with my notes, he informed me that a revision of the 'complete list' was in progress and that he would forward my notes for use in the revision. Evidently Mr. Parish has had as little to do with the 'modified' list as myself and should not be held in any way responsible for its errors. Only one species, Euonymus occidentalis, Nutt., is directly credited to me, and the unpublished name of Dr. Treleas, (E. Parishii) which is proposed for doubtless the same shrub, is given as a second species of this genus.

It is sincerely to be regretted that such inaccuracies should appear in even this comparatively unimportant paper in a publication of our government, as it tends to throw suspicion upon all the work of the Forestry division, and perhaps not with injustice in this case. So important an interest as our forests is worthy of the most careful and intelligent treatment, such as it receives at the hands of foreign countries.

It is not advisable at present to compile even an approximately complete list of our ligneus plants, pending the elaboration of recently collected herbarium material and copious field notes.

## Our Forests.

The true forests of San Diego county are, properly speaking, restricted to the higher mountainous region, comprising the Laguna, Cuyamaca, Smith's and San Jacinto mountains, usually at an altitude of 5,000 to 7,000 feet or greater. Considerable timber exists in these mountains, and at San Jacinto, saw-mills are continually at work, supplying the immediate vicinity with lumber, but none is exported. The timber is less valuable as a rule than that found at the north. Pine, and a little spruce and cedar, is the principle timber utilized. These forests are composed mainly of the following trees:

Pinus Lambertina, Dougl.
Pinus ponderosa, Dougl.
Pinus Coulteri, Don.
Pinus Sabiniana, Dougl.
Pinus Jeffreyi, Murr.
Pseudotsuga Douglasii, Carr.
Libocedrus decurrens, Torr.
Abies concolor, Lindl.
Quercus chrysolegis, Liebur.
Quercus Kelloggii, Newberry.

Pinus Sabiniana, Dougl., is not known to the writer but has been credited to the county. The only form of Pseudotsuga Douglasii, Carr., known by me to occur in the county, is the variety macrocarpa, Engelm., which does not approach in size the grand spruces of the north.

*C. R. Orcutt.*

## *EPOCH OF THE MASTODON IN NORTH AMERICA.*

The most interesting of the animals that have recently, (in a geological sense), become extinct, is probably the American mastodon, (Mastodon gigantes) which, in connection with the mammoth, or fossil elephant, (Elephas primigenius) appears to have attained a great numerical development upon this continent at about the close of the Pleistocene, or the commencement of the Post-tertiary epoch. Geologists are enabled to determine with certainty the age at which these colossal herbiverous animals existed in this country, from the circumstance that their bones are found in a partially petrified or sub-fossil state, in superficial deposits, lying above the drift formation, as for example in peat-bogs or the mud and marl deposits of existing ponds and lakes, the origin of which, it seems, cannot extend far back of the introduction of man upon this continent. Some have thought that the mastodons and mammoths did not become entirely extinct in this country until after the advent of man, and find a support for their opinion in various traditions of the North American Indians, which represent their ancestors as warring against certain colossal animals, which are described as tree-eaters, and as never lying down, but leaning against a tree when they slept. Sir Charles Lyell, however, after a review of all the facts in the case, has arrived at the opinion that the period of the extinction of the mastodon, although geologically modern, must have been many thousand years ago. Judging from the distribution of their bones the mastodons appear to have existed most numerously in the valleys of the Ohio and Mississippi, and from thence to have roamed as far to the northeast as New York and New England. Their remains, however, have been but rarely found in New England, and it has been conjectured that the Hudson river may have acted as a barrier to their migrations. The mammoth, or fossil elephant, appears to have roamed over the same territories contemporaneously with the mastodon, but in much smaller numbers. In the western States the bones of these animals are found most commonly in the low places around the salt-lick spots, that are still frequented by deer and other wild animals that come to lick up the saline waters. At one such locality in Kentucky, known as the "Big Bone Lick" about twenty miles south west from Cincinnati it is esitmated that the bones of one hundred mastodons and twenty mammoths have been dug up together with the bones of the megalonyx,buffalo,deer and other animals. The most complete skeletons of the mastodons have, however, been found in swamps and peat-bogs,in which the animals were probably accidently mired and suffocated. The finest and largest skeleton in existence was discovered by some laborers engaged in digging marl from a swamp in Newburg, N. J., in the summer of 1845. It occupied a standing position, with the head raised and turned to one side and the

tusks thrown upwards the position natural to a quadruped when sinking in the mire. In the place where the stomach lay, and partially enclosed by the ribs were found about seven bushels of vegetable matter—i.e., bruised and chopped twigs and leaves—which, without doubt, represented the food last eaten by the animal Some of these twigs, subjected to microscopical examination proved to be those of a coniferous tree, probably the white cedar. This skeleton was purchased by the late Dr. John C. Warren of Boston and is now preserved in that city. Its dimensions are as follows: Length, twenty-five feet; height twelve feet; length of tusks, ten feet. The total weight of the bones is two thousand pounds, and so slightly changed are they that they still retain a large proportion of their animal matter. In some instances there have been found in connection with the skeletons of the American mastodon, tufts of hair of a dun-brown color, varying in length from two to seven inches—thus indicating that the animal, like the Siberian mammoth, might have been fitted to endure a climate considerably colder than that in which the present elephant lives. *G. D. Story.*

## *OPUNTIA FRUIT AS AN ARTICLE OF FOOD.*

One of the most attractive fruits in the markets of Mexico and one that is always in demand is the fruit of the Opuntia, or *Tuna* as it is known to the Mexicans. Both the foreign and native inhabitants consume it, and with many, it forms the principal article of food for months in the year.

The seeds of some of the choicest varieties sold in the markets of Mexico were obtained and grown by the U. S. Department of Agriculture for distribution in localities suited to their cultivation. The *Tuna* of the Mexicans must not be confounded with Opuntias found in Arizona, New Mexico and Southern California the fruit of which is not utilized.

What is known as the cactus belt of Mexico furnishes many very fine species of Opuntia adapted to cultivation. When brought together, and each variety receives a name, as other cultivated fruits are distinguished, they will severally be sold and esteemed for their respective merits. Then especial growers of this cactus will appear and new varieties be produced by cross-fertilization and other means as in our northern fruits.

The potato and tomato when first introduced were little valued because their qualities were unknown; now the world would not care to do without them. The Opuntia fruit will be prized wherever known.

### CULTIVATION.

Scarcely a plant known to man requires so little care in its cultivation as the cactus. It will grow in nearly any soil, but best in light sandy or gravelly combinations. The Opuntia reaches

the greatest perfection on the table-lands of Mexico, where owners of estates have assured me that they have realized beyond all expenses $3,000.00 to $5,000 00 annually from the sales of this fruit and its products.

The Opuntia takes root readily when a piece of plant is laid on the ground, or a little soil may be thrown on the top of a joint, so easily is it cultivated. It will stand considerable cold, and draught does not effect it beyond causing the plant to wilt at times, from which it quickly recovers. The dryness during the most protracted drought seems to increase the sweetness of the fruit.

Give the Opuntia one-tenth of the care in its cultivation that the peach requires and it will repay you with a delicious fruit that lasts for a much longer period for market; one better for shipment; one with good keeping qualities. No insects to molest it no dangers from frost, as it blossoms after the time of frost, and protected from thieves by its spines, you can enjoy its fruit unmolested. There are some who dislike all forms of cactus because of their spines, and consider them useless, but this is a mistake. All cacti are useful to animals and birds and may be utilized by man, and the spines simply prevent their rapid destruction by animals that would greedily devour these succulent growths were they not protected.

### REMOVING THE SPINES.

When the fruit of the Opuntia is ripe, the fine spine upon their surface are readily removed by taking a bunch of grass, or any other suitable thing and switching the fruit, thus removing easily the downy spines, which, if not removed, would cause a little pain for a short time in handling the fruit. I have seen persons born among the *Tunas*, catch the fruit suddenly near the summit and wrench them off with their fingers apparently without suffering any evil consequences. If the spines are not removed at gathering, the fruit will have to be wiped before the rinds are removed, to prevent pain to the operator.

### GATHERING THE FRUIT.

There are three methods resorted to in gathering Opuntia fruit; one with the hands; second, by wooden tongs; third, with a knife. The first method can only be resorted to when the plants are low, or in gathering from the lower branches of a tall plant. By taking hold of the fruit with the fingers and giving it a sudden twist it at once detached. This is no doubt the best method of gathering for market, as there is less bruising, and if the spines were previously removed, can be at once packed for market or the "jackets" removed for immediate use. The second method of gathering the fruit by means of wooden tongs is, so

far as the writer knows, only resorted to by Indians, who gather for their own consumption.

The knife in the hand of an experienced gatherer, can be made to detach a great quantity of fruit in a day. It is much used along the table-lands of Mexico on the great estates where the Opuntia grows to perfection; and the fruit by various means rendered profitable to the owners. The blade of the knife is made of steel and is inserted into the split end of a long strong stick, the length of which enables the gatherer of *Tunas* to reach with the knife blade the joint bearing ripe fruit. The plants are often eight to fifteen feet high. The fruit is arranged around the outer rim of the joints, so, when the gatherer brings the knife blade to the joint, he separates by a quick turn that part bearing the fruit, and as quickly thrusting the blade into the severed part, brings it to the ground, when the fruit it soon denuded of its fine spines and removed. Plants present an odd appearance after the terminal joints have been thus removed, but suffer no injury and the fragments readily take root and form new plants.

REMOVING THE SKINS FROM THE FRUIT.

It is surprising what a quantity of fruit can be deprived of skins and prepared for the palate by one pair of experienced hands. A thin slice is removed from each end of the fruit; a slit is then made through the peeling along the length of the fruit. The fingers press downward quickly the separated skin leaving the pulpy fruit exposed in a tempting manner. Thus prepared, the fruit is one of the sweetest, most nutritious and refreshing of fruits, mealy and juicy, most agreeable for the warmer seasons of the year in the United States. Especially is this fruit adapted for the breakfast-table, when the languid body needs something to aid digestion. If kept as cool as a watermelon, it will prove far more agreeable than that fruit. being of a similar flavor with that of the strawberry added, and it is healthier, more nutritious and longer in season than the watermelon.

This fruit is to be found in the Mexican markets in abundance and very cheap five months in the year, and is consumed by all classes and conditions of people. Venders are to be seen along all the roads. Along the Mexican Central Railroad the earliest Tuna is ripe in June and the latest varieties disappear in November, and you are offered them in small dishes, with the epidermis removed, a thorn from the mesquit tree to carry the tempting morsel to the mouth.

This fruit is finding its way all along the frontier of the United States, and this winter I saw some fine fruit on a stand in Jacksonville, Fla., for sale.

Americans and foreigners consume this fruit with equal avidity with the Mexican and praise the flavor. When as well known in this country as in Mexico it will be utilized to the fullest degree.

*Edward Palmer.*

## *SOME NOTES ON TERTIARY FOSSILS OF CALIFORNIA.*

### PACIFIC BEACH.

An exposure of a deposit of tertiary fossils occurs at Pacific Beach, San Diego, California, on the ocean bluff north of the pavillion, extending for about a mile along the ocean beach and from five to twenty feet above tide water. In May and June, 1888, I made a small collection at this point, of which the following is a partial list:—

Olivella *biplicata.*
" boetica.
" sp. indet.
*Conus Californicus.*
Surcula Carpenteriana.
Monoceros engonatum.
" var. spiratum.
Ranella Californica.
Opalia anomala, Stearns.
" varicostata, "
Siphonalia Kellettii.
Janira bella.
Pecten hastatus?
" æquisulcatus.
" 3 sp. indet.
*Tapes staminea.*
Scalaria sp. indet.
Neverita Reclusiana.
*Norrisia norrisii.*
Pandora (mold only).
*Fusus ambustus.*?
*Acmæa mitra.*
" *insessa.*
Anomia lampe.
*Ostrea lividus.*
Lucina Nuttalii.
Cerithidea sacrata.
Amphissa versicolor.
*Amycla carinata.*
Dentalium hexagonum.
*Cardita subquadrata.*
*Littorina scutulata.*
Pteronotus festivus.
Crepidula *aduncа.*
" unguiformis.
Nassa *cooperi.*
" perpinguis.
" fossata
Omphalius aureotinctus.
Chlorostoma Pfeiferi.
" *gallina.*
*Haliotis splendens* (*fragment*)
Tellina bodegensis.
*Pomaulax undosus.*
*Macron lividus.*
Ocinebra poulsonii.
Calliostoma gemmulatum.
Tivela crassatelloides.
Drillia penicillata.
Myurella simplex.

There were about a dozen other species, not identified as yet, among them a curious form resembling an oyster valve, very thick, but too imperfect for me to determine its character.

A whale barnacle, a fine shark's tooth, numerous bones of some large animal, caseings resembling those surrounding the shells of Lithoglyphus, calcareous tubes of Serpulorbis squamigerus, and numerous specimens of Echinarachnius excentricus were also obtained in this stratum. The locality is worthy of much more careful study than I have yet given it, but the above will prove sufficient to indicate its character. Three imperfectly defined strata can be here detected:—The older turned to sandstone, containing molds of various bivalves, and the imperfect valves above referred to as slightly resembling the oyster; the second containing the Opalias, Janiras and Pectens and a species of Terebratula (?); the third, more recent in character, containing the most of the other species.

FALSE BAY.

Along the shores of False Bay, which bounds the tract known as Pacific Beach on the south, are found numerous large deposits of shells, formed largely of Donax Californicus in places, and containing remains of echinoderms, besides other mollusks. These need to be studied in connection with those before mentioned, but I have as yet given them but small attention.

OCEAN BEACH.

Ocean Beach lies south of Pacific Beach, with False Bay between them. Both lie within the limits of San Diego city. About two miles south of Ocean Beach, near the top of the cliff, about forty feet above tide water, I found another exposure in June, 1888, where I made a collection of about fifty species of shells, including those species given in italics in the Pacific list, and the following additional shells.

Omphalius fuscescens.
Monoceros lugubre.
Lottia gigantea.
Acmaea spectrum.
" pelta.
" scabra
Gadinia reticulata.
Fissurella volcano.
Calliostoma canaliculatum
Glyphis aspera.
Crepidula lingulata.
" dorsata?
Petricola carditoides.
Chama exogyra.
Balanus 3 sp. indet.
Vermetus ? sp.
Hipponyx sp. indet.
Chiton (valves).
Haliotis cracherodii.
Drillia moesta?
Monoceros sp.?
Leptothyra sp. indet.
Volvarina varia.
Bittium sp. indet.
Cumingia Californica.
Lucina Californica.
Platyodon cancellatum.
Zirphoea crispata.
Septifer bifurcatus.
Pachypoma gibberosum.
Strongylocentrotus sp.?
Serpulorbis squamigerus.

This is a very promising locality, and a much greater variety may be expected after a more careful and thorough examination of the whole exposure—only a small part having been examined by myself

ROSEVILLE.

From a cliff at Roseville, nearly east of the Ocean Beach locality and on the shore of San Diego bay, were numerous valves of Pecten æquisulcatus, Chione simillima and C. fluctifraga, imbedded in the soil a few feet above tide water. Other similar deposits are not rare along the bay shores. *C. R. Orcutt.*

---

## *THE REPUBLIC OF SALVADOR.*

A little over thirty miles south of San Jose de Guatemala begins the republic of Salvador, the smallest, though the second in point of population of the countries of Central America. The little republic is indeed the most densely populated country in both Americas, with exception, perhaps, of some of the lesser

Antilles, for the Salvadorian Republic contains only an area of a little over 7,000 English square miles, while the number of inhabitants is nearly 800,000.

Salvador was always regarded as a very rich country, and before the conquest was called by the natives, "Cuscatlan," or the land of abundance. The country was already at that period very densely populated, and its inhabitants were warlike and fierce. They defended their independence in such a spirit that it required all the energy of such a man as Pedro Alvarado to conqueror and to bring them under the Spanish dominion.

Nowadays, though Salvador suffered and suffers still from constant wars and insurrection, the country is fairly prosperous, well governed, and the best educated republic of Central America. Agriculture is extensively and successfully practiced, and the export of the products of the country is augmenting every year.

As I leave the shores of Guatemala and approach those of Salvador I remark the difference between these countries. The coast of Guatemala is low and sandy with the mighty chain of the Andes far in the interior; that of Salvador is high and rocky and of volcanic origin. There is no sandy beach here, but the hills descend to the waters' edge and form a steep fantastic shore, not barren and wild, but green and covered with a crown of the most exquisite trees and parasitic plants.

The first harbor I meet on the coast of Salvador is Acajutla. It is a considerable town as the export place of the northwestern part of the republic. It is connected by railway with the city of Sonsonatte, further in the interior, one of the most important places in the republic.

Acajutla looks half like a city and half like an Indian village. The houses as usual are low, but the streets are paved. But what a pavement! I believe that even the streets of San Francisco have a better pavement than those of Acajutla. It is a torment for the poor barefooted Indians to walk on those streets, and even those who use shoes or boots are very anxious to avoid them.

The houses of Acajutla, and especially outside of the town proper, form a very curious sight. They are constructed of bamboo or rather coyoles branches and are protected by enormous and very high fences. But those fences are neither of wood, nor of stone nor wire, but of cactus. The cactus and especially the giant cardon grows here to an enormous size and very rapidly. Planted around the house in a short time it will grow to a considerable hight and will form a most magnificent and durable fence. No animal and no snake can force such a formidable fence and the inmates of the house can rest secure. Sometimes the giant cardon reaches the stupendous height of sixty

feet, and when this is the case, you cannot see the house, but only a green and high palisade of tall and prickly cacti.

From Acajutla to La Libertad the shore of Salvador is known under the name of Costa del Balsamo, or Balsam Coast. It is a magnificent part of the republic, green and fresh, fragrant from the odor of numerous gorgeous flowers, watered by many mountainous creeks, covered with numerous haciendas and fincas. The hills, not too high or too steep, run in soft undulations to the shore, while toward the east they become higher and higher until they meet the principal chain of the Andes. The Balsam Coast itself produces indigo, sugar, cotton, tobacco, coffee and maize, and is of extreme fertility. But the glory of the coast is the famous balsam, known as "Balsam of Peru," which is produced in the woods of this coast in such quantities that over 30,000 pounds are annually exported.

Speaking about balsam, I must mention that under this term we understand now the balsams of Peru and of Tolu. Both balsams have a very fragrant odor and they are used in confectionary, in perfumery and especially in medicine. The two balsams mentioned are very similar to each other in their properties and both are produced by trees of the genus Myroxylon, or Myrospermum of the Leguminosae, Myrospermum peruiforum, commonly called the "Quinquino," grows in abundance in Central America, and chiefly from this beautiful tree is prepared the celebrated balsam of the coast of Salvador. Myrospermum toluiferum is a very similar species to the former, but grows mostly on the banks of the Magdalena river and in the mountains of Venezuela and New Granada. The mountains of Tolu gave the name to this balsam.

At the end of Costa del Balsamo we meet the fair town of La Libertad, the second harbor on the coast of Salvador. The scenery around the town is magnificent; in fact the prettiest on the coast, for just behind the harbor begin the hills, covered with the most costly woods and with magnificent fruit-bearing trees of the topics. The cool stream, the river Chillama, runs close to the town; and on its banks the luxuriant vegetation reigns in its supernatural beauty. Over the houses of the town tower the high cocoanut trees laden with fruit, and close to them lingers the graceful curica, papaya, ceiba, henisaro, matapalo, guayago del monte, guiscoyol, mahogany and nispero form dense groups; feathery, delicate leaves of banana and plaintains shine with the color of purest emerald under the glowing sun, and the taller columnar cardon cactus shoots like an arrow towards the blue sky.

The town of La Libertad is a small, delightful place, composed of low adobe houses, surrounded by luxuriant gardens. It is the harbor of San Salvador, the capital of the republic, and all merchandise destined to that place has to go through La Liber-

tad. The coach runs from the harbor to the capital, which is situated further in the mountains, on a high volcanic plateau.

San Salvador is now a fine and well built city, though it has none of its former splendor. In 1854 it was a magnificent city, with many churches,palaces and splendid buildings, but on the night of April 16th, of that year, it was completely destroyed by one of those terrific earthquakes which are so frequent in Central America. The city was rebuilt and was again partly destroyed in 1873. It remains, however, always the seat of government and the capital of the republic.

The inhabitants of San Salvador pride themselves on being the most polished and the most cultured in Central America They read a great deal and study much, and are, without question, better posted on all social and political questions than are their neighbors of Honduras or Guatemala. The ladies study also a little, and willingly discuss all known, or unknown questions with anybody who happens to come in their way. With strangers they are free, bold and very anxious to know what the ladies in other countries do, how they dress and how they spend their time. The Salvadorian ladies flirt a little more than their sisters in other Spanish-American republics, and are very anxious to marry early. In fact, it is regarded as a disgrace if the lady does not marry. The Salvadorian ladies compare favorably with their sisters in Guatemala or Nicaragua. They are affectionate; generous, but quick tempered; brilliant, but superficial; vain and vacillating; courageous in the highest degree, but capricious. They like the song and dance, but not so much as the ladies of Leon.

South of La Libertad the coast is very rocky and steep, and contains no harbors until we reach the beautiful gulf of Fonseca. In that magnificent expanse of water Salvador possesses the old Spanish town and harbor of La Union.

La Union has a suffocating climate, for the harbor is landlocked and the fresh sea breeze seldom enters. It is burning hot everywhere and you breathe the air of a furnace. Had Charles Dickens been in La Union he would never have described Marseilles as he did in "Little Dorrit," for Marseilles compared with La Union would have been an arctic place. Here in La Union everything is hot; the wind, if there is any, the staring dusty streets, the sandy beach, and even the water within the harbor. The people do not walk on the streets in the daytime if they can avoid it, but remain at home smoking and swinging in large comfortable hammocks, for the hammock in this *tierra caliente* takes the place of a bed and very often of a chair.

La Union is a considerable but a very lazy and lifeless place. Only when the fair takes place-and this happens a few times every year—the inhabitants loose their lethargy and are as gay and

frivolous as the inhabitants of Leon and Puntarenas. They sing and dance and make love like veritable children of the sun.

The Andes of Salvador form a highly volcanic central range with no less than sixteen volcanic peaks from four to eight thousand feet high. The volcano Isalco near Acjutla is always in eruption, and the traveler can constantly see the fire and smoke, and hear the roar of ejected lava. Salvador possesses also many lakes and rivers, as for instance the lakes Guija and Llopango and the river Lempel and San Miguel. There are many considerable cities and towns in the interior, and among others are Sosonatte, Santa Ana and San Miguel. The richness of the country consists mainly of the products I mentioned before, and especially of tobacco, the best in Central America. The mineral wealth is not great, although there are some silver and iron mines near Santa Ana and Tabanco.

The government of the republic is carried on by a president, vice-president and two ministers. The legislature consists of two chambers, an upper one of twelve senators and a lower of twenty-four representatives. The standing army is only 1,000 men, though in case of necessity everybody is called to arms. In the last struggle with Guatemala (1885) Salvador in the short space of a few days had an army of 12,000 men, and what an army it was the battle of Chalchnapa has shown.—*M. Lopatecki.*

## *NATIVE PLANTS OF AUSTRALIA.*

Australian plants have proved in many cases equally well adapted to the soil and climate of the Pacific Coast. The director of the Technological Museum, Sydney, furnishes an interesting book on the useful plants of that continent, from which we glean the following notes of some, as yet unknown to this coast.

It may not be generally known that Australia produces an indigenous hop, which in the early days of settlement, was extensively used for making yeast and beer.

Eucalyptus dumosa yields a kind of manna, which is eaten by the natives in some parts of Victoria. It is the nidus of an insect and is a starch-like substance resembling small shells, white or yellowish-white in color and sweet to the taste.

The settlers of Tasmania obtain a kind of cider from a species of gum, and another species (Eucalyptus Viminalis) also yields a sweet manna.

The native cherry (Exocarpus Capressiformis), has excited considerable attention in Europe from the fact that, contrary to the usual order of things, the stones grow outside of the fruit.

Baron von Muller recommends the culture of Geitonoplesium cymosum as a substitute for aspargus.

The native peach or *quandong*, Fasauns accuminatus, makes

an excellent preserve or jelly and may be dried and used like preserved apples.

In waterless localities the fleshy roots of the needle or pin-bush Hakea leucoptera, yield good drinking water to those who understand how to get it.

The Rumquat or desert melon, Atlantia glanca, may be made into a fair preserve.

An infusion from the fragrant bark of the sassafras, (Atherosperma moschata) is used in the form of a beer and has a pleasant taste when taken with plenty of milk.

The natives of New South Wales and Queensland prepare a cake which resembles a coarse ship biscuit from a bean tree known as *Italic* or *Bogum.*

In cases of severe thirst much relief may be obtained by chewing the leaves of the shingle oak (Casnarina stricta.) Being of an acid nature the chewing of the leaves produces a flow of saliva.

The native currant (Coprosura Billardieri), the *Moor* of the natives of Coranderrk station was formerly used by the settlers in making puddings.

## *BRIEFER ARTICLES.*

PRESERVING THE COLORS OF FLOWERS.—A process of preserving the colors of flowers in dried specimens, as used in Berlin, consists of steeping the plants in a solution of sulphurous acid containing one-fourth of its volume of methylated spirit. Delicate flowers require an imersion of but five or ten minutes, and thick leaves as much as twenty-four hours. They are then removed, the fluid is allowed to evaporate, and the plants are dried between paper in the usual way. *Sci. American.*

A PETRIFIED BIRD'S NEST.—Harlan H. Ballard, President of the Agassiz Association, describes in *St. Nicholas* for June, his experience with a petrified bird's nest containing three eggs. It is a useful article and a timely warning against being "taken in" by any apparently wonderful production of nature. These nests it seems, are prepared in Italy by immersing in water impregnated with mineral salts, thus producing an artificial petrifaction. It may be well to note the distinction between the words, petrifaction, and fossil, which are too often used as synomyns: a petrifaction may be defined as anything "turned to stone," or encrusted by a mineral substance, and may be either natural or artificial; a fossil is "a substance dug from the earth," or plant or animal remains (petrified or otherwise), from the strata composing the surface of the earth. It would not be strange if the nest described by Prof. Ballard had been a natural petrifaction as he supposes it may be but for the presence of *three* eggs. It would be possible for a bird in our western country to build and hatch its young in such a situation as he describes, where the nest at a different season might be subject to the overflow of a non-peren-

nial spring, and one egg failing to hatch, might have remained in the nest. I have seen such a locality where the still green and growing moss was slowly but surely becoming petrified (*i. e.*, incrusted by a mineral, deposited on its surface, by the water flowing over it), while other mosses had become wholly petrified. The vegetable substance in some specimens had decayed, while in others, only the fibres, incrusted by a calcareous substance, still remained. Specimens of petrified moss are not rare from the State of Michigan, but the locality I refer to was in the mountains of Lower California, and I am confident that the "water is dry" a great portion of the year and would not interfere with nest building, should a bird select the site and begin operations before the rainy season. *C. R. Orcutt.*

Albinism among Flowers.—The editor has collected specimens of each of the following plants bearing only pure white flowers. Usually the whole plant was of a lighter green than that of the other plants which bore flowers of the normal hue.

| | |
|---|---|
| Delphinium decorum, F. & M. | Brodiæa capitata, Bth. |
| Linaria Canadensis, Dum. | Sidalcea humilis, Gray. |
| Mirabilis Californica, Gray. | Gilia dianthoides, Endl. |
| Orthocarpus purpurascens, Benth. | Erythræa venusta, Gray. |

A single plant of Mimulus cardinalis, Dougl., was once found in Lower California, with yellow flowers, which a well known botanist proposed to call a new species, but I advised him of its true character in season.

The Erythræa venusta, Gray, is often pure white and runs through the lighter shades of purple into its normal color. In the wet spring of 1884 I secured so many large and beautiful white-flowered specimens of this, as to lead Dr. Gray to inquire if it was not a valid species. The plant is very variable otherwise as to size and shape of foliage and flowers. *C. R. Orcutt.*

## *PROCEEDINGS OF SCIENTIFIC SOCIETIES.*

San Francisco Microscopical Society,—June 12th, 1889. A. H. Beckenfeld, the Vice President, was present for the first time since recovering from his severe illness, and was cordially welcomed. His contribution to the evening's programme represented some fine specimens of Melacerta ringens, a tube-building rotifer, belonging to the family of wheel animalcules. This variety is considered the most beautiful of the species, and builds for its protection an ingenious tube, which it forms of round pellets that are elaborated in the interior of the animalcule, and securely gummed together with a secretion derived from the same source. This rotifer, when feeding, extends itself partly from its tube and by means of several rows of cilia produces a rapid rotary motion one set of cilia drawing a current of water containing food to its mouth, while another row ejects the debris by a current produced

in an opposite direction. The tube and occupant are highly transparent and viewed by dark ground illumination never fails to excite astonishment and wonder at the sagacity displayed by nature in protecting these minute organisms from their enemies and furnishing them with such elaborate means for obtaining their subsistence. Mr. Breckenfeld also exhibited a slide of Æcidium or "cluster-cup fungus" found infesting the scanty vegetation on Signal Peak, Yosemite Valley, some seven thousand feet above sea level.

Dr. E. G. Clark exhibited some interesting slides of Cinnabar ore in Chalcedony, showing free mercury, a rare thing in the natural state. The gentleman also showed a beautiful mounting of chrystallized gold, displaying the peculiar fern-leaf disposition of the chrystals produced by the galvanic current.

The most notable feature of the evening was the exhibition by Charles C. Riedy of his collection of old and rare works of the early writers on microscopy. To the student and all interested in micrographical literature this was an opportunity seldom offered to examine many volumes published by the pioneers in this branch of science, that are now very scarce. Mr. Riedy is devoted to the study of the Infusoria, and to facilitate his inquiries in that direction the present collection has been slowly accumulated, though not without great difficulty and perseverance, many of his orders for special works having been several years in the hands of European book-dealers before they were obtained. The different volumes cover the entire field of microscopical research from its very beginning, and contain a complete resume of the evolution of optical science, together with the progress of mechanics as applied to the microscope. Many of the editions, in fact a majority of them, contain a high grade of illustrations considering the date when they were executed, while some are embellished with fine-lined copper-plate engraving that would do credit to our own day. The oldest publications, belonging to the fifteenth and sixteenth centuries, are all bound in heavy parchment, and mostly written in the scholarly language of the time—Latin. The printing is remarkably good and legible, there being no perceptible fading of ink or paper. The authors represented were Adams, Baker, Baster, Bonanni, Descartes, Ellis, Eichhorn, Gleichen, Gotze, Grew, Hill, Hooke, Joblot, Ledermuller, Leeuwenhoek, Martin, Needham, Power, Redi, Schaffer, Glabber, Smith, Spallanzani, Schott, Swammerdam, Trembley. Notable among these are Decartes' works, with numerous wood-cuts, small quarto, Amsterdam, 1650. This work contains an illustration of Descartes' gigantic microscope eight feet high.

In the collection is Powers' "Experimental Philosophy,in three books, containing new experiments, microscopical, mercurial, magnetical." London, 1664. This last work is the earliest volume on the microscope in the English language.

Before adjourning a unanimous vote of thanks was tendered

Mr. Riedy for his interesting exhibition of what is certainly the most unique collection of rare microscopical literature in the United States. *C. P. Bates, Rec. Sec.*

Santa Barbara Society of Natural History.—May 25, 1889. Dr. L. G. Yates presented a specimen of Allanite from Santa Barbara county, and read a paper on this new and rare mineral. Mr. Goodyear, of the State Mining Bureau, in a letter to Dr. Yates, stated that the portion of Santa Cruz Island already examined to be mostly volcanic rock.

## *BIBLIOGRAPHY.*

L. H. Bailey. Studies of the types of various species of the genus Carex. Mem Torr. Bot. Club, Vol. 1, No. 1., New York, 1889, 8vo pp. 85. Price, $1.00. The author presents the results of an examination of the existing types of the North American species, which are widely scattered, largely in European herbaria. Numerous changes in nomenclature are naturally found necessary.

R. W. Shufeldt. Observations upon the osteology of the North American Anseres. Proc. U. S. Natl. Mus. XI:215-251. Washington, 1889. From the author.

E. L. Greene. Pittonia Vol., 1, Part 6. March.May, 1889. The present number completes the first volume and contains an account of the vegitation of San Benito islands, off the Lower Californian coast, a treatment of some Californian Umbelliferae, descriprions of new species, and various botanical notes and discussions. Miss Mary Graham also contributes to this number her interesting "Reminiscences of Major John E. Le Conte."

New Mexican Spanish Antiquities. *The Nation.* March 8.

Colonization of Lower California. *Science.* Apr. 5.

The San Felipe Sink, (California.) *Am. Meteorological Journal.* March.

D. Mariager. A Zuni Genesis. *Overland Monthly.* April.

W. Cross. Denver Tertiary Formation. *Am. Jour. Sci.*, April.

F. A. Fernow. Science and "Christian Science." *Pop. Sci. Mo.*, April.

T. F. T. Dyer. Plants in Witchcraft. *Pop. Sci. M.*, April.

Senator Stewart. Reclaiming the Deserts of the West. *Forum.* April.

Emin Pasha in Central Africa. A collection of the White Pasha's letters and journals is issued by Dodd, Mead & Co., containing invaluable information gathered by him on his explorations. "On the geography of plants and animals"; and "On the state of civilization and politics" are the titles of two of the several headings under which the work is arranged. Two portraits of Emin Pasha, and a map are given.

## *EDITORIAL.*

Each year presents a startling record of terrible loss of life and property by the elements. But 1889 surpasses any previous year in the history of the English race. Early in the year came the news of disaster at Apia, where our American navy suffered so severely. The sympathy of the whole civilized world is now aroused by the fearful calamity at Johnstown, Pennsylvania, on May 31st. Ten thousand people hurled into eternity by the pitiless torrent escaping from the Conemaugh artificial lake, upon its dam giving way, and two thousand more roasted alive in the conflagration that succeeded the flood. Before this loss of life, the twenty-five millions of property destroyed is insignificant. The whole Conemaugh valley is a scene of desolation, not only Johnstown, but other towns and villages and farm houses along this beautiful river have been washed away with thousands of their inhabitants. It is impossible at this time to estimate the total loss of life and property sustained by this section of country.

Our contributors will please note that MSS. should reach us as early as the first of the month preceding publication to secure the earliest insertion. Reports of societies and scientific news may be sent later but should reach us as early as possible, that they may not loose in interest by delay. When possible, articles, especially if of a technical character should be prepared by a typewriter. Proofs are not read by the Editor but we have engaged careful and experienced readers for this service.

Europe, Asia and Africa has each contributed to the Editor's mail of late. As four months were consumed in transit by a letter from Asia, we shall not be burdened by correspondence from that quarter, but now that San Diego is likely to be soon in direct communication with China and Japan, through the Peninsula and Oriental Steamship line, we may hope that the SCIENTIST may become still better known in those countries.

Two or more new steamship lines are being inaugurated between San Diego and Mexican ports, which we hope may soon be in operation. The west coast to the south of us has been but little known to naturalists, and with these increased facilities for transportation, we may hope to learn more of its natural history in the near future. Numerous naturalists have already done what they could under existing difficulties, and each has found much of interest in every branch of science.

---

## *NOTES AND NEWS.*

TATA-ALBUMEN is a variety of albumen, studied by Dr. Helbig which is transparent, even when boiled. It was first found in the egg of a certain species of sand marten. Later it was ascertained that by the action of soda or potash, ordinary egg albumen could

be converted into tata-albumen, it thereby becoming doubled in bulk and glassy in appearance. It is eight or ten times more digestible, more stable, and allows the addition of any spice.

"The Land of the Midnight Sun" must indeed be an interesting portion of the earth's surface to visit if we may judge from the extremely interesting and beautifully illustrated article about that region that appears in *Demorest's Monthly Magazine for July.*

The sound of the axe and the hammer, not only on the assembly grounds, but all around the lake is responded to by the people near and far in notes of preparation for the season's great annual festival at Chautauqua. Fifteen years have passed since the opening of this summer school in the woods. Chautuaqua has ever refused to do any but thorough work, its power has become international, and it has bound friends by the thousand to itself. All the year round, through its literary circles and otherwise, its influence is felt not only in every state in the union but beyond the sea and the great gatherings of the summer are but the logical results of this vital under current.

The botanist of our U. S. Department of Agriculture is referred to by an English contemporary as *Sir* George Vasey. His descriptions of grasses adapted to arid districts are widely copied.

Lentils and tares are receiving considerable attention in South Australia, where they are cultivated for fodder,

Rabbits, sparrows, kangarcos, paddymelens, hares, foxes and kangaroo rats seem to be the more troublesome of the animals in Australia, on which the Government offers bounties.

A thick shower of small frogs is reported in the "Western district" by the *Victorian Farmers' Gazette*, of April 29th.

The rabbit diseases commission of New South Wales has reported unfavorably on M. Pasteur's proposal to extirpate rabbits by means of chicken cholera. The commission finds that the use of the microbes in the food does not cause the disease to spread rapidly from infected to healthy rabbits.

The latest maritime curiosity in British waters is a torpedo boat burning petroleum or tar refuse in place of coal. The vessel has made nineteen knots an hour without permitting any perceptible smoke, and is said to move quite noiselessly. She is 137 ft. in length and her crew numbers only seven men.

The wax-scale of Florida, (Ceroplastes floridensis) has been discovered in California, on trees imported this season from Florida, according to a note in *Insect Life*. It is not noted as a pest in Florida, but occasionally it will increase upon an individual tree so as to arouse apprehension.

Samuel Lowell Elliot died February 12, aged forty-five years. He was a careful student of the habits of insects and very suc-

cessful in contriving methods for rearing and studying living insects.

Mr. T. S. Brandegee and Mrs. Mary K. Curran, both of San Francisco, surprised their friends by a quiet wedding on May 29th. They were married in San Diego by Rev. Dr. Noble. THE SCIENTIST offers them its heartiest congratulations.

Messrs. T. S. Brandegee and Walter Bryant returned in May from an extensive trip through Lower California. We failed to meet Mr. Bryant and so did not learn the extent of his success, but Mr. Brandegee reported the collection of about thirty species of cacti; and altogether nearly a thousand species of plants, while his field notes will give the most southerly stations for many of the Californian plants.

Prof. L. F. Ward, (Proc. U. S. Natl. Mus.), shows that the genus Platanus, of only seven existing species, was at its zenith in the Cretaceous and Tertiary periods.

Chlorogalum parvifolium is abundant on portions of the San Diego mesas, where it grows scarcely six inches high. We recently measured a specimen of this lily which we collected in a canyon among our foot hills—the loose, spreading panicle of flowers of which, stood *seven feet high!* The bulbs are frequently as large as onions, and the height above recorded is not exceptional.

Frederick A. P. Barnard, President of Columbia College, died April 27th. He was born May 5th, 1809, at Sheffield, Mass. He ranked with the most advanced thinkers of the day, and did much to enhance the scientific standing of the United States. In microscopy and astronomy he did excellent work, and his labors were recognized by the conferring of honorary degrees from many universities.

The seeds of the alfilaria are gathered by the ants in Southern California, in considerable quantities, judging from the hulls which they pile around the openings to their nests.

*The Century* for June contains an interesting and instructive illustrated sketch of an "American Amateur Astronomer," Mr. Burnham, formerly of Chicago, now of the corps at the Lick Observatory.

Among the articles in *St. Nicholas*, for June that will interest young naturalists, is one by Anna Botsford Comstock, on "Hidden Homes." Prof. H. H. Ballard, President of the Agassiz Association, also contributes a suggestive paper on "Amateur Photography."

# Shells For Sale by C. R. Orcutt, San Diego, Calif.

**Acmaea, Esch.**
.15..depicta, Dall
.20..insessa, Hds
.05..mesoleuca, Mke
.15..paleacea
.05..pelta, Esch
.10..var. elevata, Orcutt
.05..testudinalis

**Acus, Humphrey.**
.50..aurcola, Gray
.25..caerulescens, Lam
.25..crenulata, L
.20..denudata
.05..dislocatus, Say
.20..maculata, L
.20..strigillata, Gray
.20..subulata, Lam

**Adeorbis, Wood.**
.25..subcarinatus, Mont

**Adula, H. & A. Adams**
.20..falcata, Gld
.15..stylina, Cpr

**Alexia, Leach.**
.10..personata, Midd
.05..setifer, Cooper

**Alvania.**
.20..aequisculpta, Cpr

**Amalthea, Schum.**
.50..conica, Schum

**Amiantis, Cpr.**
1.00..callosa, Conr

**Amnicola, Gld. & Hld.**
.05..cincinnatiensis, Anth
.10..cahcniana, D'Orb
.05..decisa, Hld
.05..grana, Say
.05..integra, Say
.05..lapidaria, Say
.05..limosa, Say
.15..longinqua, Gld
.05..lustrica, Say
.10...pallida, Hld
.20..panamensis, Tryon
.05..parva, Lea
.05..porata, Say
.25..sp. indet, Utah

**Amphibola, Schum.**
.20..fragilis, L
.12..nux-avellana, Chem

**Amphissa, H. & A. Ad.**
.10..corrugata, Rve
.20..versicolor, Dall

**Ampullaria, Lam.**
.50..chiqintensis, D'Orb
1.00..cumingii, Sby
2.00..olivacea, Spix
.50..scalaris, D'Orb

**Amycla, H. & A. Ad.**
.05..carinata, Hds
.10..var. hindsii, Rve
.15..chrysalloidea, Cp
.10..gausapata, Gld

**Anachis, H. & A. Ad.**
.10..coronata, Sby
.10..fluctuata, Sby
.10...guatamalensis, Sby
.10..penicillata, Cpr
.20..pygmaea, Sby
.20..rugosa, Sby
.20..rugulosa, Sby
.20..subturrita, Cpr
.20..varia, Sby

**Ancillaria, Lam.**
.50..accuminata, Lam
.15..ampla, Gmel
.20..candida, Lam
.20..cinnamomea, Lam
.15..fulva, Swains
.75..glabrata, Swains
2.00..montronzieri, Sby
.15..rubiginosa, Swains
.40..tankervillii, Sby
.40..torosa, Mensch
.20..vesicula, Gmel

**Anapa, Gray.**
.50..triquetra. Hawley

**Ancnlosa, Say.**
.10..ampla, Anthony
.05..plicata, Conr
.10..rubiginosa, Lea

**Ancylus, Geoffroy.**
.05..fluviatilis, Lam
.20..lacustris
.15..rivularis

**Angitrema, Hald.**
.50..angulata, Wetherby

**Angulus, Schum.**
.10..gouldii
.10..molestus
.10..obtusus, Cpr
.15..variegatus

**Anodonta, Cuvier.**
2.00..bridgesii, Lea
.50..californiensis, Lea
1.00..corpulenta, Cp
.50..cygnaea, L
1.00..var inflata
1.00..var. limpida
.50..edentula, Say
.75..ferrusaciana, Lea
.25..fluviatilis, Dillw
1.00..grandis
2.00..jewettii, Lea
.50..oregonensis, Lea
1.00..wahlametensis, Lea

**Anomia, L.**
.20..aculeata, Gmel
.10..ephippium, L
.25..glabra Verrill
.25..lampe, Gray

**Aporrhais, Dillw.**
.25..occidentalis, Beck
.25..pes-pelecani, L

**Asaphis.**
.25..deflorata, L

**Arca, L.**
.20..americana
.15..incongrua
.30..mutabilis
.15..noae, L
.30..ponderosa Say
.30..solida, B & S
.30..tetragona
.30..virescens, Rve

**Assiminia, Leach.**
.10..californica, Tryon

**Astarte, Sby.**
.15..castanea, Sby
.25..couradi, Shuttl
.25..equimalti, Baird
.15..sulcata, Da Costa

**Astyris, H. & A. Ad.**
.10..aurantiaca, Dall
.10..chrysalloidea, Cpr
.10..tuberosa, Cpr
.10..variegata, Stearns

**Atys, Montfort.**
.20..cylindrica

**Auricla, Lamarck.**
.50..parva, Swainson
.50..aurismidae, L
.25..elongata, Parr
.05..fasciata, Desh
.25..solida, Swainson

**Avicula, Lam.**
.25..brevicauda, Desh
.20..hirundo, L
.20..margaritifera, Brug
.25..tarentina

**Axinaea, Poli.**
.50..maculata, Brod

**Bankivia, Beck.**
.10..varians, Beck

**Barleeia, Clark.**
.10..haliotiphila, Cpr

**Bithynia, Gray**
.15..leachii, Shep
.05..tentaculata, L

**Bela, Gray.**
.20..brachystomoides

**Bittium**
.05..filosum, Gld
.10..lawleyanum, Crosse
.05..nigrum, Totten
.15..quadrifilatum, Cpr
.05..reticulatum, DC
.05..scabrum, Olu

**Blauneria, Shuttl**
1.00..pellucida, Pfr

**Bryophila, Cpr**
.15..setosa, Cpr

**Buccinum, L**
.25..glacialis
.20..undatum, Lam
.25..undulatum, Moll

**Bulimnea, Hald**
.25..megasoma

**Bulinus, Adams**
.10..hypnorum, L

**Bulla**
.20..Adamsi, Mke
.20..ampulla, L
.15..occidentalis, Adams
.20..solitaria, Say

**Busycon, Bolten**
.50..perversum, L

**Caecum, Flem**
.10..californicum Dall
.25..crebricinctum, Cpr

**Calliostoma, Sun**
.50..annulatum, Mart
.20..canaliculatum Mart
.15..costatum, Mart
.50..gemmulatum
.50..exiguus, Pult
.15..striatus, L
.50..tricolor

**Callista, Poli**
.25..gigantea, Chem
.25..maculata, L
.50..lupisearia, L

**Callopoma, Gray**
.50..fluctuosum, Gray
.50..fokkesii, Jones
.25..tessellatum, Reeve

**Calyptraea, Lam**
.25..conica, Brod
.10..chinensis, L
.50..dilleyani, Gast
.20..equestris
.20..striata

**Cancellaria, Lam**
.35..reticulata, I
.30..similaris, Sby

**Canthurus, Bolten**
.50..tinctа, Conr

**Cardita, Brug**
.25..affinis, Sby
.25..floridana, Conr
.15..sulcata, Lam

**Cardium, L.**
.50..aculeatum, L
2.00...blandum, Gld
.50...corbis, Mart
.10...consors, Brod
.20...isiaudicum
.50...isocardia, L
.75...magnum, Born
.25...muricatum
.15...mortoni, Conr
.10...norvegicum, Speng
1.00...paucicostatum, Sby
.25...serratum, L

**Casmaria, H. & A. Ad.**
.50...vibex, L

**Cassidula, Ferrussac.**
.50..crassiuscula

**Cassis, Lamarck.**
1.00..abbreviata, L
.75...eburneus, Brug
.50...undatum, Mart
.50...testiculus, L
1.00...tessellata

**Ceratisolen, Forbes.**
1.00...legumen, L

**Cerithidea, Swains.**
.20..ambigua, C B Ad
.10..californica, Nutt
.15...decollata, Lam
10..icstoma, Pfr
.20...mazatlanica, Cpr
.25..montaguii, D'Orb
.25. obtusa, Lam
.15..ornata, Ads
.15..pulchra, C B Ad
.10...scalariformis, Say
.15...tenuis, Pfr
.25...varicosa, Sby
.15..mamillata, Risso

**Cerithiopsis, F. & H.**
.15..tuberculata, Mart
.15...tuberculoris, Mart

**Cerithium, Brug.**
.20...carbonarium
.20. echinatum, Lam
.05..ferrugineum, Say
.20..fasciatus, Wood
.10...fusciatum, Risso
.10..literatum, Born
.25...maculosum, Kien
.20...mamillatum, Risso
.10...morus, Lam
.10..muscarum, Say
.10..nigriscens, Mke
.40...nodulosum. Brug
.35...obeliscus, Brug
.25...polygonum, Sby
.20...reticulatum, DaCosta
.05...rupestre. Brug
.15..scabrum
.10...stercus-muscarum
.15..var
.05...septemstriatum, Say
.10..uncinatum, Gmel
.20..versicolor, C B Ad
.20...violaceum
.25...vulgatum, Brug

**Chama, L.**
.50..acnella, L
.22...arcinella, L
.25..exogyra, Conr
.25..macrophylla, Chemn
.20..spinosa
.00...sp indet Gulf Cal

**Chemnitzia, D'Orb.**
.25...castamea, Cpr
.25...stylina, Cpr
.25..tenuicula, Gld
.25..tornata

**Chilina, Gray**
1.00...fluctuosa, Gray
1.00...fluviatilis, Gray

**Chione, Megerle**
.25...californiensis, Brod
.20..cancellata, L
.50..dombei, Lam
.50..granulata, Gmel
.40...grata, Sby
.20...paphia, L

**Chiton, L**
.50..acuta, Cpr
.15..apiculatus, Say
.20..cinereus, L
.25..decoratus
.20...circulus
.20..gemmeri, Cpr
.25...lamuginosa, Cpr
1.00..tunicata, Sby
.50..hindsii, Gray
.30..mertensii
1.00..wassnessenskii, Midd
1.00...stelleri, Midd
.50...stokesii
.15..lineata, Wood
.30...rugatus
.70..lignosa, Gld
.40..merckii, Midd
1.00...acrior

**Chiton, L.**—Cont.
.20..striatus
.35...piceus, Gmel
.50...cooperi
.35...palmulatus, Cpr

**Chlorostoma, Swains**
.10...ater, Lesson
.10...argyrostomus, Gmel
.15...aureotinctum, Fbs
.15...brunneum, Phil
.15..lineata, Da Costa
.20...pfeifferi, Phil

**Chrysodomus, Swain**
.15..dirus, Rve
1.00..kennicotti, Dall

**Circe, Schumacher**
.25...auvaricatus, Lam
.50...gibba, Lam
.35..rivularis, Born

**Clypidella, Swainson**
1.00..bimaculata, Dall
1.00..callomarginata

**Collonia, Gray**
.15..granulosa, Pse
.25..vitiensis, Bar

**Columbella, Lam**
.10...carinata, Hds
.10..cribraria, Lam
.20..concinna, Sby
.20..duclosiana, Sby
..flava, Lam
.05..fulgurans, Lam
.10..fuscata, Sby
.10...gausapata
.10...haemastoma, Sby
.15..lunatia, Sby
.20..lutea, Suoy
.20...maculosa, Sby
.20...major, Sby
.05...mercatoria, L
.10..nitiela, Lam
.20..obesa
.20..paytensis, Lesson
.05..rustica, L
.10..scripta, L
.15..seumpieata, Steanns
.20..strombiformis, Lam
.20..semiconvexa, Lam
.10..varians, Sby
.20..versicolor, Sby
.20..zebra, Gray

**Cominella, Gray**
.50..costata, Suoy

**Concholepas, Lam**
.25..peruviana, Lam

**Conohelix, Swains**
.50..conicus, Schum

**Conus, L**
.25..abbreviatus, Conr
.30..achatinus, Chemn
.75..amadis, Mart
1.00...ammiralis, L
.20..arachnoides, Gmel
1.25..araneosus, Hwass
.30..arena
.40..arenatus, Hwass
.50...archiepiscopus, Hw
.20...aristophanes, Ducl
1.25..augur, L
.10..aurantius, Hwass
.30..australis, Lam
1.25..bandanus, Hwass
1.25..betulinus, L
.50..capitaneus, Hwass
.25..catus, Hwass
.35..cedonulli, Brug
.30..ceylonensis, Hwass
.35..cinereus, Hwass
1.00..cingulum, Mart
.20..concinnus, Brod
1.00..costatus, Chem
.30..daucus, Hwass
.30..distans, Hwass
.40..eburreus, Hwass
.75..figulinus, L
.50..flavidus, Brug
.25..floridensis, Gabb
.10..franciscanus, Hwass
.25..fuscatus, Born
1.00..gabrieli, Kr
.50..generalis, L
.60..geographus, L
.40..gladiator, Brod
.30..glans, Hwass
.20..granulatus, Hwass
.35...gubernator, Brug
.25..hebraeus, L
1.00..hyena, Brug
1.25..imperialis, L
.25..interruptus, Sby
.30..laeteus, Lam
.50..legnarius, Rve
.50..leoninus, Brug
.60..lineatus, Chem
1.00..literatus, L
.30..lithoglyphus, Menke
.50..livi ius, Brug
1.50..maculatus, Sby
.25..mahogani, Sby
.50..marmoreus, L
.25..mediterraneus, Brug
1.00..mendomtaraon, Ch
.15..menotus, Brug
.35..mi es, L
.25..miliaris, Hwass
1.00..millepunctatus, L
.25..minimus, L
.60..monile, Brug
.20..mus, Hwass
.25..musicus, Hwass
.20..nebulosus, L
.60..nussatella, Burg
.25..nux, Brod
.40..obesus, Brug
.40..omaria, Brug
.30..parius, Rve
.50..papilionaceus, Brug
1.00..pealii, Green
.25..planorbis, Born
1.00..prineeps, L
1.00..prometheus, Hwass
.25..proteus, Hwass
.25..pulicarius, L
.25..punctatus, Ch
.25..punctieulatus, Hwass
.50...purpuraseens, Brod
.20..pusillua, L
.25..pusio, L
.60..quercinus, Hwass
.25..rattus, Brug
.25..regularis, Sby
.30...senator, L
.30..speetrum, L
.30..sponsalis, Chemn
.50..spurius, Gmel
.30..stereus-muscarum Ch
.40..stellatus, Rve
.40...stramineus, Lam
.75..striatus, L
.50..sulcatus, Hwass
.50..sumatrensis, Lam
.25..taemiatus, Br
.35..terebra, Br
.30..terminus, Sby
.40..tessellatus, Brug
.25...testudimeus, L
.60..textile, L
1.00..tiaratus, Brod
.30..trigris, L
.15...tornatus, Br
.50..tulipa, L
.35..varius, Brug
.20..venulatus, Hwass
.30..vermiculatus, Brug
.25..verrucosus, Brug
1.25..vexillum, Mart
1.00..victoriae, Rve
.60..virgo, L
.35..vitellus, L
.25..vitulinus, Br
1.00..vulpinus, Brug

**Cooperella, Carp**
.25..scintillaeformis, Cpr

**Coralliophila H & A Ad**
.50...costulata, Eld

**Corbicula, Magerle**
.50..pusilla, Bourg

**Corbula, Brug**
.15..contracta, Say
.10..gibba, Olioet
.10..inoequioalois
.20..lineolata, Say
.15..nucleus, L

**Crassatella, Lam**
.20..marginata Cpr

**Crenella, Brown**
.10..glandula, Totten
.20..marmorata, Fbs

**Crepidula, Lam**
.05..aculeata, Gmel
.10..convexa, Say
.15..dorsata, var
.30..dilatata, Lam
.15...elongata
.15..excavata, Brod
.10..fornicata, Gmel
.10..marginalis, Brod
.20...onyx, Sby
.10..plana, Say
.10..unguiformis, Lam

**Crucibulum, Schum**
.35..corrugatum, Brod
.20..trigonale, Ad & Rve
.15..quinquinum, Les

**Cryptogramma, Mch**
.20...impressa, Hanley
.25..macrodon, "
.25..squamosa, "

**Cuma, Humphrey**
25...coronatum, Lam
.25..imperialis, Lam
.25..kiosquiformis, Ducl
.25..sacellum, Lam
.25..tectum, Wood

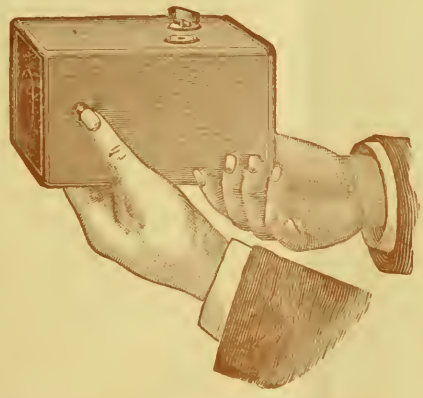
**Cumingia, Clessin**
.15..tellinoides, Coast

**Cyclas, Brug**
.05..rivalis, Drap
.05...rivicola, Leach
.05...similis, Say
.05..staminea, Con
.05..transversa, Say

**Cymba, Brod**
1.00...neptuni, Gmel
.25..porcina Brod
1.00..proboscidialis, Lam

**Cypraea, Linn**
.15..abella, Lam
.20..achatina, Soland
.25...acicularis
.50...adusta
.10..albuginosa, Maw
.50..amathystea, L
.25..annulus, L
.20...annulata, Gray
.40...approximans
.50...arabica, L
.25..arenosa, Gray
.75..argus, L
.40..arenaria
.40..armadina
.10..asellus, L
..angustata, Gmel
.50..aurantium, Mart
.25..arabicula, Lam
.50..atomari, Gmel
1.00..australis, Gray
1.00..bartheleysii, Gmel
1.00..bicallosa, Grey
1.00..bicolor, Gask
.50..boivini, Kien
.15..caput-serpentus, L
.75..carneola, Mart
.25..caurica, L
.50..cervus, L
.15..cinerea. Gmel
.20..clandestina, L
.40...eruentata, Gmel
1.00..cervinetta, Kien
.25..cruenta, L
.25..cicercula, L
.35..eribraria, Lam
.50..chrysoscoma, Kien
.15..citrina, Gray
.50..clara, Gask
.40..coffea, Gray
.50..concava, Gray
.25..childreni, Gross
.25..contamina, Gray
.30..controversa, Gray
.20..candidula
.25..costata
.50..capensis, Gray
.25..cervici, Sby
.40..comptonii, Gray
1.00..cribellum, Gask
.20..cylindrica, Born
.75...cumingii
.50..dubia, Gmel
.35..eburnea, Bar
.25..edentula, Sby
1.00..eglantina
.15..erosa, L
.25..errones, L
.10..europea, Mont
1.00..exanthema, L
.50..fasciata, Chem
.50..felina, Gmel
.50..flaveola, Lam,
.50..fimbriata, Gmel
.50..ziagilis, L
.50..zusca
1.00..gangeronosa, Dill
1.00..gemmula, Mof
1.00...gooda li, Gray
.75..gracilis, Gask
.75..guttata, Gray
.40..globosa, Kien
.15..helvola, L
.35..histrio, Kien
.25..hirundo, L
.30..isabella, L
.25..inseeta
.30..interrupta, Gray
.20..irrorata, Gray
.50..intermedia
.50..irina
.35..'amarekii, Gray
1.00..lurida, L
.25..lynx, L
.15..limacina, Lam
.50..lentiginosa, Gray
.50..lutea, Gmel
.50..listerii, Gray
1.00..lathynis
.50..madagascariensis, Gm
1.00..mauritiana, L
1.00..mappa, L
.50. mus, L
.20..moneta, L
1.00..maculata, Barnes
1.00..momiliaris, Lam
.40..miliaris, Lam
1.00..menkiana, Desh
2.00..modesta
1.50..moosa, Brod
1.00..maugeriae
1.00..macula, A. Ad
1.50..microdon, Gray
2.00..mappa, var rosea
.25..neglecta, Sby
.20..nucleus, L
.30..nigropunctata
.50..nymphii
.25..nivea, Gray
.20..nivosa, Sby
.50..onyx, L
.25..oecelata, L
.20. obvelata, L
.20..obesa
1.00..oniscus
.50..oryza
.10..pulex
1.00..princeps
1.00..physis, Brocchi
.40..pallida, Grey
1.00..pustulata, L
.50..pantherina, Grey
.30..picta, Gray
.15..poraria, L
1.00..punctulata, Gray
1.00..pulchella, Sw
.50..punctata, L
.50..pyrun, Gwel
.50..parjalida, Dks
1.00..peasii, Gask
1.00..pettitiana, Crisse & Fer
1.00..piperata, Sol
1.00..pulvana, Rve

# THE KODAK CAMERA.



# The Kodak · Camera

## *ANYBODY*

Who can wind a watch can use the KODAK CAMERA. It is a Magazine Camera, and will make 100 pictures without reloading. The operation of taking the picture is simply to point the Camera and press a button. The picture is taken instantaneously on a strip of sensitive film, which is moved into position by turning a key. . . . . .

## *A DIVISION OF LABOR.*

After the 100 pictures have been taken, the strip of film (which is wound on a spool) may be removed and sent by mail to the factory to have the pictures finished, thus relieving the purchaser of all the trouble of finishing the pictures. Any amateur can finish his own pictures, and any number of duplicates can be made of each picture. A spool of film to reload the Camera for 100 pictures costs only Two Dollars. . . . . .

## *NO TRIPOD IS REQUIRED.*

No focussing, no adjustment whatever. Rapid rectilinear lens. The KODAK will photograph anything, still or moving, in-doors or out. . .

## *A PICTURESQUE DIARY*

Of your trip to Europe, to the mountains or the sea-shore may be obtained without trouble with a KODAK CAMERA, that will be worth, in after years, a hundred times its cost.

## *A BEAUTIFUL INSTRUMENT.*

The KODAK is covered with dark Turkey morocco, nickel and lacquered brass trimmings, enclosed in a neat sole leather carrying case, with shoulder strap, and is about the size of a large field glass. . . . . .

Size, . . 3¼ x 3¼ x 6½ inches.

PRICE, . . . $25.00.

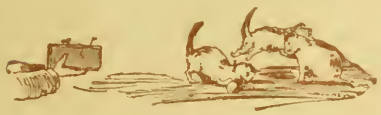
Weight, 1 lb. 10 oz.

Size of picture, 2⅝ inches diameter.

Loaded for 100 pictures, including sole leather carrying case, with strap. . . . . .

Reloading, developing and printing (100 pictures), $10.00. Negatives returned with the prints. .

IF YOU ARE INTERESTED, SEND FOR



The Kodak · Primer

WITH KODAK PHOTOGRAPH, SENT FREE ON APPLICATION.

# *Sam C. Partridge*

529 COMMERCIAL ST., SAN FRANCISCO, CAL.

*Partridge*

69 Morrison Street,
Portland, Or.

THE MOST COMPLETE AND CAREFULLY SELECTED
STOCK OF
PHOTOGRAPHIC OUTFITS AND MATERIAL
ON THE COAST.

MANUFACTURED AT

ROCHESTER, N. Y.,

BY

THE EASTMAN DRY PLATE AND FILM CO.

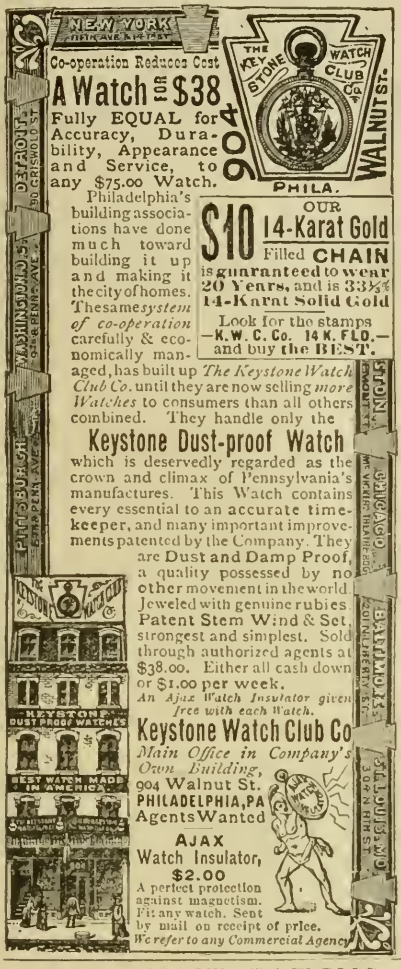
PRINCIPAL KODAK AGENCIES.

LONDON:
The Eastman Dry Plate and Film Co.,
115 Oxford St.

PARIS:
M. Nadar, 51 Rue d' Anjou.

BERLIN:
Romain Talbot, Bruderstrasse, 10.

SAN FRANCISCO:
Sam C. Partridge, 529 Commercial St.





## THE GIANT CATCUS.

Living plants of this "Monarch of the Desert" supplied at from $5.00 to $100.00 each, according to size.

**B. F. JOHNSON & SONS,**
ZENOS, A. T.
For trade prices address C. R. ORCUTT, San Diego, Cal.


## ALL FOR 25 CENTS.

A fine Indian Arrow-head, Piece of Pottery, Starfish, Sea-urchin, Shark's Egg, 3 minerals, Chinese Coins, 14-page price-list of curiosities, etc., copy of COMMON SENSE, a 16-page magazine for collectors, 35c per year. F. A. THOMAS, Publisher,
Mexico, New York.

## ROYAL PALM NURSERIES

The finest and most extensive collection of *Tropical* and *Semi-Tropical Plants* in America. Many adapted to Southern California. More than 20 varieties of bananas. 150,000 one year old palms. Fruit, ornamental and economical plants from Australia, Japan, Hong-Kong, India, South Africa, South America and all parts of the tropical world. New and valuable descriptive catalogue of 100 pages, mailed to any address, upon receipt of 10 cts. Address,

**REASONER BROS.,**
Manatee, Florida.

## Geological and Archæological Specimens
—AND—
## Scientific Books.

Corals from the falls of the Ohio a specialty. Can furnish from a single example to one hundred thousand. Correspondence with advanced collectors and professors of colleges solicited. Best of reference given and satisfaction guaranteed or money refunded.

**G. K. GREENE,**
170 East Third St., New Albany, Ind.

## PORTRAITS.

**YOUR HOME MADE BEAUTIFUL**
By a lorning them with the
FACES OF LOVED ONES.

The *New York Artists' Union* is the only organization doing *genuine Crayon, Pastels and Oil Portraits* of friends living or dead, from photographs, tin-types or any correct likeness. They can fill, and therefore solicit orders from all parts of the United States. *Conscientious work on the smallest as well as the largest contracts is their rule. Satisfaction guaranteed or no pay required.* All work done by *Graduated Artists. Now is the time to send your order.* Send for our illustrated circular of prices, etc., to

**The New York Artists' Union,**
Mention this paper] 10 East 14th St., New York.

## NEW DIRECTORY!!

WE are engaged in compiling a NEW Oologists' and Ornithologists' Directory, to be issued August 5th, 1889. We desire the addresses of all Collectors. Names inserted free. Do not neglect this opportunity to increase your collections by exchanges from all parts of the world. Exchange notices a special feature, 10 cents each for 25 words or less. Extra words at same rate. This will be the largest and best Directory ever published. Order now. A limited number of reliable advertisements inserted at reasonable rates. Write for terms. Address all communications to

**MENEFEE & CORLESS,**
SAN JOSE, CALIF.

# BOOKS.

## A LITERARY EVENT.

A library of American literature from the earliest settlement to the present time—edited and compiled by E. C. Stedman and Miss E. M. Hutchinson. A complete library in 10 vols.

**A. L. BANCROFT & CO.,**

**132 Post Street, San Francisco, Cal.**

AGENTS WANTED.

## THE OPEN COURT.

**Published Weekly at 169 LaSalle Street, Chicago, Ills.**

A Journal devoted to Science, Philosophy & Morals.

Send for Free Sample Copy.

Price $2.00 a Year. P. O. Drawer F.

## BOOK CHAT!

*Brentano's, Publishers, 5 Union Square, N. Y.*

Book Chat contains monthly a complete index to the periodical literature of the world. Indispensable to Botanists, Conchologists, Geologists and Scientists generally. $1 a year; 10c. for a single copy.

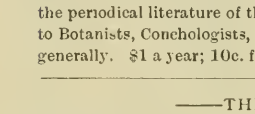
—THE—

## AMERICAN GEOLOGIST!

IS A MAGAZINE

Devoted to Geology and Allied Sciences—the only one in America—published by a number of Professional Geologists distributed over the central part of the United States. Three Dollars a Year.

Address THE AMERICAN GEOLOGIST, Minneapolis, Minn.



100 VARIETIES of Beaded Buckskin and War Relics of the Sioux of Dakota, Apaches, Pueblos and Navajoes of New Mexico. A large stock of Oregon and other States' Stone Relics of all kinds. All the leading Minerals and Fossils of the Black Hills and Dakota Bad Lands. Wholesale and retail. Send for large, illustrated catalogue.

L. W. STILWELL, Deadwood, D. T.

SUBSCRIBE FOR

## The West American Scientist

The Oldest and Best Scientific Monthly published on the Coast.

**PRICE, $1 PER ANNUM.**

**SAMUEL CARSON & CO., Publishers,**

208 POST STREET, San Francisco.

## IMPORTANT NOTICE.

# Botanists, Nurserymen,

**SEEDSMEN AND FLORISTS.**

Cycas revoluta, C. circinalis (tree ferns), Alsophila, crinata, A. gigantea, Cythea hemitilia, Dendrobium maccarthæ, D. Aureum, D. cruminatum, D. macrostachys, Vanda spathulata, Vanilla phalarnopsis, Eria bicolor, Cleistoma maculosum, and over 40 of the best varieties of Lycopopiums, Ferns, Palms, Pandanus, Euphorbia, Opuntia, and other varieties of seeds and plants supplied.

**We will pack and deliver free at any sea-port:**

A case of 250 Orchids, 20 varieties.....$100
" 500 " 30 " ..... 150
" 200 Cycas circinalis, stems 6 inches.. 100
" 500 " " " 4 to 12 inches high..... 250
A case of 1,000 Bulbs, 10 different varieties, such as Crium Oranatum, C. Asiaticum, Pancartium, Gloriosa, Methonica, Alocasias, &c. 175

Coffea arabica, C. Liberica, Thea Asamica, T. Hybrida, T. in igenians, Cichona, Legeriana, Cardamonum pinernigram, Myristica, Clove of Commerce, Caselpinia sappan, C. Davidivi, E. coca, Theobroma cocoa, Cocoas mucifera, Vanilla planifolia, Sarcinia mango-tana, and over 50 different varieties of FRUIT TREES. Price list of seeds and plants can be had on application to **C. R. ORCUTT, Seedsman, San Diego, California,** to whom all orders should be addressed.

Also, Bird Skins and Eggs, Shells, Bones, etc., applied from Ceylon and elsewhere.

## J. P. ABRAHAM,

Grand Pass, Colombo, Ceylon.

**$93 Sewing-Machine FREE**

To at once establish trade in all parts, by placing our machines and goods where the people can see them, we will send **free** to one person in each locality, the very best sewing-machine made in the world, with all the attachments. We will also send **free** a complete line of our costly and valuable art samples. In return we ask that you show what we send, to those who may call at your home, and after **2** months all shall become your own property. This grand machine is made after the **Singer** patents, which have run out; before patents run out it sold for **$93**, with the leitschments, and now sells for **$50**. Best, strongest, most useful machine in the world. All is free. No capital required. Plain, brief instructions given. Those who write to us at once can secure **free** the best sewing-machine in the world, and the finest line of works of high art ever shown together in America. **TRUE & CO., Box 740, Augusta, Maine.**

## DR. LORYEA'S

# NEW HAMMAM

FOR LADIES AND GENTLEMEN.

**218 POST STREET,**

Bet. Dupont and Stockton, SAN FRANCISCO.

**The Finest Turkish, Russian, Electric, and Medicated Baths in the City.**

**Single Bath, $1. Six Tickets, $5.**

Open for Gentlemen, Day and Night, Sundays included. For Ladies, from 8 A. M. to 6 P. M.

## THE WESTERN EXCHANGE BUREAU.

Books, Magazines, Indian Relics, Minerals, Stamps, etc., bought, sold or exchanged. Send two-cent stamp for a copy of the *Monthly Bulletin*.

Address THE EXCHANGE BUREAU, Orrville, Ohio.

**HOME TREATMENT FOR CONSUMPTION AND NERVOUS DEBILITY.**—Medical and Hygienic. Address with stamp, H. A. MUMAW, M. D., Homœopathic Physician and Sugeon, ORRVILLE, OHIO.

## —:THE NAUTILUS:—

FOR CONCHOLOGISTS.

(Formerly "The Conchologists' Exchange.")

IMPROVED! ENLARGED! ILLUSTRATED!

*Issued monthly. Subscription $1.00 per annum*

H. A. PILSBEY, Editor,

Address WM. D. AVERELL, Manager Mt. Airy, Philadelphia, Pa.

**BIRDS, SKINS AND EGGS.**

NEW PRICE LIST OF FRESH SOUTHERN CALifornia Bird Skins sent for stamp. Charles H. Marsh, Dulzura, Cal.

Our A, B, C's—Accuracy, Brevity, Completeness.

## WEST AMERICAN SCIENTIST

*"Decidedly the best of its class."*

An illustrated monthly magazine of popular science—the only one in the West.

$1.00 year; 10 cents a copy.

For shells, fossils, plants, bulbs, ferns, cacti, seeds, etc, address the editor, Chas. Russell Orcutt, San Diego, California.

## The Acme No. 3 Microscope,

FOR FINEST WORK:

With 3-5 inch and 1-5 inch objectives, 2 eye-pieces power 60 to 700), glass slides and covers, in case.....$ 83.00

With same outfit, but with addition of the 1-15 oil immersion objective and substage condenser (power 50 to 1600)..... 150.00

## The Acme No. 4 Microscope,

As illustrated, a thorough instrument for professional or educational use:

With 1 in. & 1-5 in. objectives, two eye-pieces (power 40 to 600), glass slides and covers in case.$55.00

## The Acme No. 5 Microscope,

An instrument of simple but thorough construction, with good lenses, and at a minimum cost:

With 1 inch and 1-5 inch objectives, 1 eye-piece (power 40 to 360), in case.....$28.00

☞Send for complete catalogue of Microscopes, sample copy of the *Microscopical Bulletin*, and clearance-sale list.

In the Acme Microscopes, we especially pride ourselves on the *accurate fitting* and *smooth working* of the focal adjustments, which are vital points in a microscope. Our rack and pinion is unexcelled for perfect action.

JAMES W. QUEEN & CO.,

Manufacturing Opticians,

**924 Chestnut St., Philadelphia, Pa.**

DO YOU READ

# THE COSMOPOLITAN,

That Bright, Sparkling Young Magazine.

## The Cheapest Illustrated Monthly in the World.

**25 Cents a Number. $2.40 per Year.**

THE COSMOPOLITAN is literally what the press universally calls it, **"The Best and Cheapest Illustrated Magazine" in the World.**

## Subscribe—AN UNUSUAL OPPORTUNITY—Subscribe

The Cosmopolitan, per year.....$2 40
THE WEST AMERICAN SCIENTIST, per year..... 1 00

The price of the two publications.....$3 40
*We will furnish both for only*.....*$2 75*

*The Cosmopolitan furnishes, for the first time in magazine literature, a Splendidly Illustrated Periodical at a Price hitherto deemed impossible.*

☞TRY IT FOR A YEAR.☜

*Do you want a first-class Magazine, giving annually 1300 pages by the ablest writers and cleverest artists—as readable a Magazine as money can make—a Magazine that makes a specialty of live subjects?*

**Send $2.75 to Samuel Carson & Co., 208 Post St., San Francisco, and secure both "The Cosmopolitan" and "The West American Scientist."**

# JOSEPH GILLOTT'S
## Steel Pens

FOR ARTISTIC USE in fine drawing, Nos. 659 (Crowquill), 290 and 291.
FOR FINE WRITING, Nos. 303 and Ladies', 170.
FOR BROAD WRITING, Nos. 294, 389 and Stub Point, 849.
FOR GENERAL WRITING, Nos. 332, 404, 390 and 604.

Joseph Gillott & Sons, 91 John St., N. Y.
HENRY HOE, SOLE AGENT,
*Sold by ALL DEALERS throughout the World.*
Gold Medal Paris Exposition, 1878.

A. WENTSCHER,
## GENERAL COMMISSION
FORWARDING AND SHIPPING.
**San Diego, Cal.**

**ARE YOU FOND OF USING TOOLS OR** Tinkering? If So send One Dollar for THE UNIVERSAL TINKER AND AMATEUR'S ASSISTANT. Tells Amateurs about turning and lathe work, Painting, Staining, Book Binding, French Polis ing, Wood Finishing, Fretwork, Amateur Printing, the Magic Lantern, etc. Single c pies 10 cts. Address HODGSON & BARWOOD, 294 Broadway, New York, N. Y.

## IT WILL PLEASE YOUR BOY
or girl and your neighbor's boy or girl to receive a paper "all their own." Try sending them the
*YOUNG IDEA*
The best low-priced juvenile magazine publishe l; 12 pages, 36 columns, monthly, illustrated, only 50 cts. a year; sample free. Address THE YOUNG IDEA, Grant C. Whitney, publisher, Belvidere, Ill.

## COLLECTORS
Who wish to obtain first-class European or African Natural History Specimens will oblige by sending class of desiderata to
DR. REED, Jr.,
Ryhope, Sunderland, England.

**$85 Solid Gold** Watch. Sold for **$100.** until lately. Best $5 watch in the world. Perfect timekeeper. Warranted. Heavy Solid Gold Hunting Cases. Both ladies' and gents' sizes, with works and cases of equal value. **One Person** in each locality can secure one free, together with our large and valuable line of **Household Samples.** These samples, as well as the watch, we send **Free,** and after you have kept them in your home for **2** months and shown them to those who may have called, they become your own property. Those who write at once can be sure of receiving the **Watch** and **Samples.** We pay all express, freight, etc. Address **Stinson & Co., Box 812, Portland, Maine.** FREE

# Consolidated National Bank.

**CAPITAL PAID IN, - $250,000.**
**SURPLUS FUND, - - 50,000.**
**Undivided Profits - - 75,961**

BRYANT HOWARD, - - - - President.
J. H. BARBOUR, - - - Vice-President.
JOHN GINTY, - - - - - - Cashier.
W. R. ROGERS, - - - Assistant Cashier.

—DIRECTORS.—

Hiram Mabury, O. S. Witherby, John Ginty,
E. W. Morse, James McCoy,
J. H. Barbour, Bryant Howard.

☞ Exchange on all the Principal Cities of America and Europe bought and sold.

# The Savings Bank.
OF SAN DIEGO COUNTY.
In the Consolidated Bank Building, corner of Hand and Fifth streets.

**CAPITAL, - - - $100,000.**

: :OFFICERS:-:

E. W. Morse, - - - - - - President.
J. H. Barbour, - - - - Vice-President.
John Ginty, - - Secretary and Treasurer.

: :DIRECTORS:-:

O. S. Witherby, H. Mabury, E. W. Morse,
James McCoy, Bryant Howard.

Interest Allowed on Deposits. Money Loaned on Real Estate

# ORCHIDS, CYCADS,
## Bulbs, Seeds and Roots.

Dendrobium maccarthiæ; D. aureum; D. cruminatum; D. macrotachyum; Vanda spathulata, etc., etc.: each cluster, 50 cents—by mail, 75 cents. Cycas revoluta and Cycas circinalis stems of all sizes from $5.00 to 50 cents. Lilies—Pancartium, Gloriosa methonica, each, 50 cents, by mail. Price list on application.

### NATURAL HISTORY.

Bird skins of over 40 species peculiar to Ceylon, mounted or unmounted. Curiosities, bird's eggs, shells, bones, etc., etc. An assorted collection of 24 species of bird skins by mail for $45. All orders should be be sent to **C. R. ORCUTT, Editor The West American Scientist,** San Diego, California, of whom nurserymen and florists can obtain circular on application. Coffee, Thea, Cocoa, Cinchona, Peppers, Palms, etc., etc. Fresh seed always in stock. Tree Ferns and Lycopods.

**J. P. ABRAHAM, Nurseryman & Florist**
Grand Pass, Colombo, Ceylon.

# IT IS IMPORTANT

For collectors to know where they can purchase specimens the cheapest. We invite all to send for our illustrated price lists, etc.

**STEARNS' CURIO SHOP,**
Headquarters for Low Prices,
ELKADOR, IOWA.

# SAMUEL CARSON & CO.

MAKE a specialty of supplying **Libraries**, for which they have exceptional facilities, because of their connection with many of the largest publishing houses as special agents, and by carrying the stock of all American publishers. They will be glad to give prices on lists of proposed purchases and solicit correspondence with librarians and other book-buyers on points of interest to them. Noted for their **Promptness, Carefulness** and **Low Prices**, they will send to any address, on application, **Catalogues of Standard Miscellaneous Works or Juvenile Books.** Books for District School Libraries, School and College Text Books constantly on hand; also Globes and School Apparatus.

SAMUEL CARSON & CO.,

Publishers, Booksellers and Stationers,

WHOLESALE AND RETAIL,

*208 Post Street, San Francisco.*

(School Warrants taken in payment).

**Fire.** **Marine.**

California's Million Dollar Company.

INSURE

IN THE

FIREMAN'S FUND

OF CALIFORNIA.

Cash Capital.....$1,000,000.00
Assets..... 2,350,000.00
Losses Paid in 26 Years ..... 8,000,000.00

HOME OFFICE:

Company's Building, S. W. cor. California and Sansome Streets,

SAN FRANCISCO, CALIFORNIA.

DAVID J. STAPLES, *President.*

WM. J. DUTTON, *Secretary.* ALPHEUS BULL, *Vice President.*

BERNARD FAYMONVILLE, *Assistant Secretary.*

CENTRAL DEPARTMENT,
**THOMAS S. CHARD, Manager**
157-159 LaSalle St., Chicago, Ill.

EASTERN DEPARTMENT.
**CHAS. W. KELLOGG, Manager**
Mason Building, Boston, Mass,

HENRY HEWETT & CO., Agents, Portland, Or.
W. P. COLEMAN, Agent, - Sacramento, Cal.
BISHOP & CO., Agents, - - Honolulu, H. I.
BEN. H. WILSON & BRO., Agts., Denver, Colo.
G. F. MCLELLAN, Agent, Los Angeles, Cal.
HUGH ANDERSON, Agent, - Salt Lake, M. T.
C. F. ELLIS, Agent, - - - Helena, M. T.
HAMILTON & STEVENS, Agts., San Diego, Cal.

Agents in all Principal Localities throughout the U. S.

SMITHSONIAN INSTITUTION LIBRARIES
3 9088 01425 0799

American Scientist

v. 6 (whole no. 45)

July 1889